INVESTIGATOR'S ANNUAL REPORT

National Park Service

All or some of the information provided may be available to the public

Reporting Year: 1996	**Park:** Shenandoah NP
Principal Investigator: David DeSante	**Office Phone:** 415-663-2052 **Email:** ddesante@birdpop.org
Address: The Institute for Bird Populations, P.O. Box 1346 Point Reyes Station, CA 94956-1346 US	**Office Fax:** 415-663-9482

Additional investigators or key field assistants (first name, last name, office phone, office email):

No co-investigators

Permit#:
SHEN1996ARVM

Park-assigned Study Id. #:
unknown

Project Title:
Bird Monitoring: Monitoring Avian Productivity And Survivorship (Maps) In Shenandoah National Park (N-150)

Permit Start Date: Jan 01, 1998	**Permit Expiration Date** Jan 01, 1998
Study Start Date: Jan 01, 1996	**Study End Date** Jan 01, 1996

Study Status:
Completed

Activity Type:
Inventory

Subject/Discipline:
Birds / Ornithology

Objectives:

The major objective is to monitor the primary demographic parameters of landbirds in Shenandoah National Park. Specific objectives are: (1) to establish and operate six MAPS stations in Shenandoah National Park for at least ten consecutive years that will provide: (a) annual indices of adult population size and post-fledging productivity of the breeding landbirds of the park from data on the numbers and proportions of young and adult birds captured; and (b) estimates of adult survivorship and recruitment into the adult population for these species from mark-recapture data on the adult birds captured; (2) to examine long-term trends in population size, productivity, and survivorship among Shenandoah's landbirds and attempt to infer proximate demographic causes for observed population changes; (3) to incorporate these data from Shenandoah into the continent-wide MAPS Program; and (4) to evaluate the usefulness of the MAPS Program as one component of Shenandoah National Park's and the National Park Service's long-term ecological monitoring efforts.

Findings and Status:

We completed the fifth year of the MAPS Program in Shenandoah National Park and the fourth consecutive year at all six of Shenadoah's revised MAPS stations. Each of the six stations was operated for one day in each of nine consecutive 10-day periods between May 31 and August 22. A total of 4907.2 net hours was accumulated in 1996 at all six stations combined. A total of 1401 captures of 45 species was recorded in 1996, somewhat less than last year's total of 1584 captures. As in previous years, indices of total adult population size tended to be higher at higher elevation stations and at stations dominated by red oak habitat, and lower at stations dominated by chestnut oak habitat. Indices of adult population size increased overall (by 8.5%) and increased at five of the six stations, although none of the increases were significant. Productivity (the proportion of young in the catch), however, decreased significantly overall by 30.2% from 0.444 to 0.310, and decreased at all six stations by amounts ranging from -0.037 to -0.197. ; Estimates of adult survival rates were obtained for 11 species using both a transient and non-transient model. The transient model was selected (by the lowest AIC) for three species, the non-transient model for seven species, and the two models were essentially equivalent for the final species. For the 11 species analyzed (using the transient model), the mean survival rate was 0.539; the mean capture probability was 0.500; and the mean proportion of resident individuals was higher than at any other location yet examined at 0.653. ; Ten of the 11 target species showed increasing population trends over the past four years (1993-1996); only Indigo Bunting showed a decreasing population trend. The largest increases tended to occur in groud- or shrub-nesting forest species. We hypothesize that population increases in these species resulted from high productivity caused by excellent nesting success that resulted from heavy shrub cover that, in turn, resulted from reduced canopy cover caused by recent defoliation from gypsy moth infestation.

; We calculated projected trend indices from a simple demographic model using mean four-year poroductivity indices and constant-time survival rate estimates for all 11 species and separately for the five species for which relatively precise (CV<35%) survival rate estimates were obtained. We found that these trend indices were positively correlated with the actual population trends both for all 11 species (r=0.558, P=0.075) and for the five species for which precise survival rate estimates were obtained (r=0.998, P=0.000). The strongest relationship was obtained using survival rates derived from the transient model and a model that assumed that the survival of young was 0.5 that of adults. These important results indicate that the estimated or indexed primary demographic parameters generated from MAPS are capable of predicting the relative population trends of the various species with considerable accuracy, and futher suggest that between-species biases in these estimates and indices are small. Inspection of the productivity indices and survival rate estimates of the various species suggest that the population increases for several ground- or shrub-nesting species forest species, including Hooded and Worm-eating warblers, Ovenbird, and Eastern Towhee, were indeed caused by high productivity, while the decrease in Indigo Bunting was likely caused by low survivorship.; Results from the first five years of the MAPS Program in Shenandoah National Park suggest that meaningful indices and estimates of primary demographic parameters can be obtained for 11 target species at Shenandoah that will be useful for guiding management decisions in the Park. We conclude that the MAPS Protocol is very well-suited to provide one component of Shenandoah's long-term ecological monitoring effort and recommend continuation of MAPS indefinitely into the future.

For this study, were one or more specimens collected and removed from the park but not destroyed during analyses?

No

Funding provided this reporting year by NPS:	**Funding provided this reporting year by other sources:**
17584	0

Fill out the following ONLY IF the National Park Service supported this project in this reporting year by providing money to a university or college

Full name of college or university:	**Annual funding provided by NPS to university or college this reporting year:**
n/a	0